G2582A Drift Gas Upgrade Kit

Quick Start Guide

The G2582A Drift Gas Upgrade Kit allows the Agilent 6560 Ion Mobility Quadrupole Time-of-Flight (IM-QTOF) LC/MS instrument to:

- Use drift gases other than high purity nitrogen
- Automatically regulate the pressure of the drift tube

To install the Drift Gas Upgrade Kit, refer to the Drift Gas Upgrade Kit *Installation Guide*.
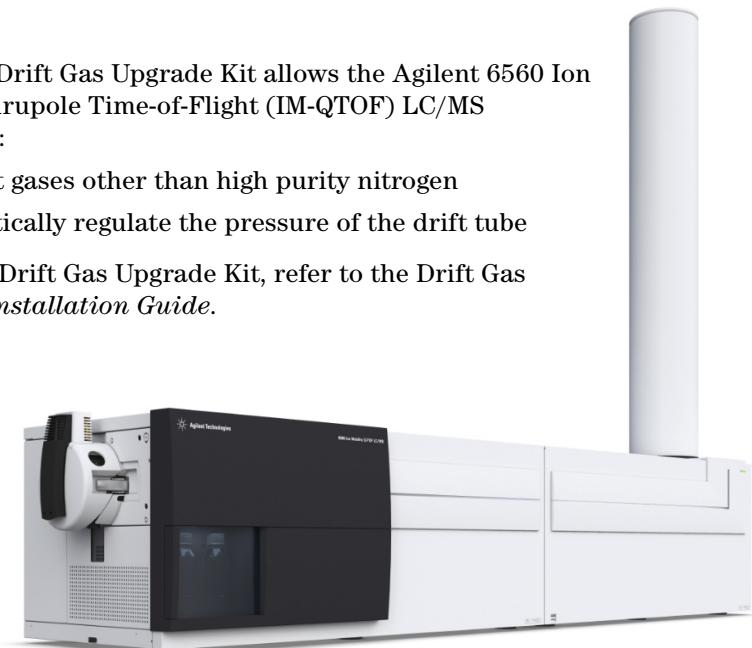
Agilent Technologies

Gas Plumbing Overview

The IM-QTOF instrument uses a drift tube that is pressurized using high purity nitrogen drift gas to achieve Ion Mobility (IM) separation. The standard gas plumbing for the IM section of the IM-QTOF instrument is shown in Figure 1.
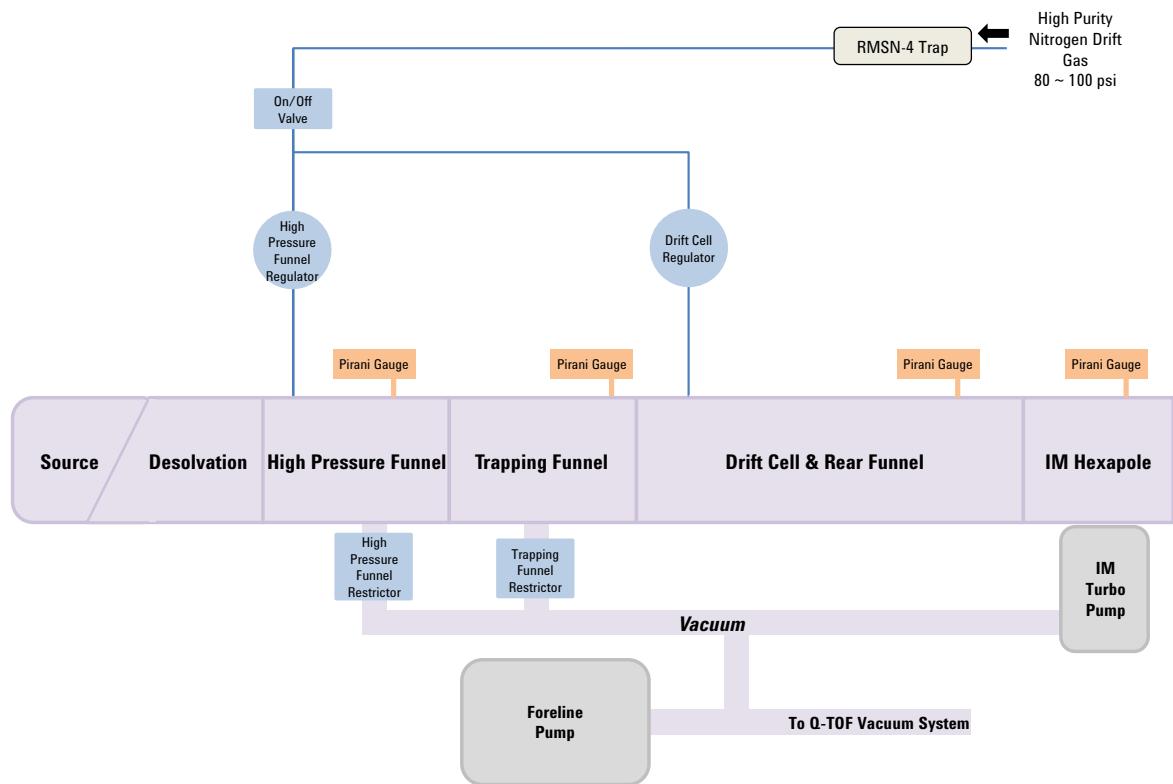

Figure 1   Gas plumbing for IM-QTOF instrument (IM section)

In the standard configuration, the drift gas tube supports only high purity nitrogen. Also, the gas pressures delivered to the drift tube are statically regulated and can vary slightly based on ambient or experimental conditions.

The Drift Gas Upgrade Kit adds:

- capacitance diaphragm gauges to measure vacuum levels
- electronic pressure controller for the drift tube
- updated control electronics

The plumbing configuration with the Drift Gas Upgrade Kit installed is shown in Figure 2.
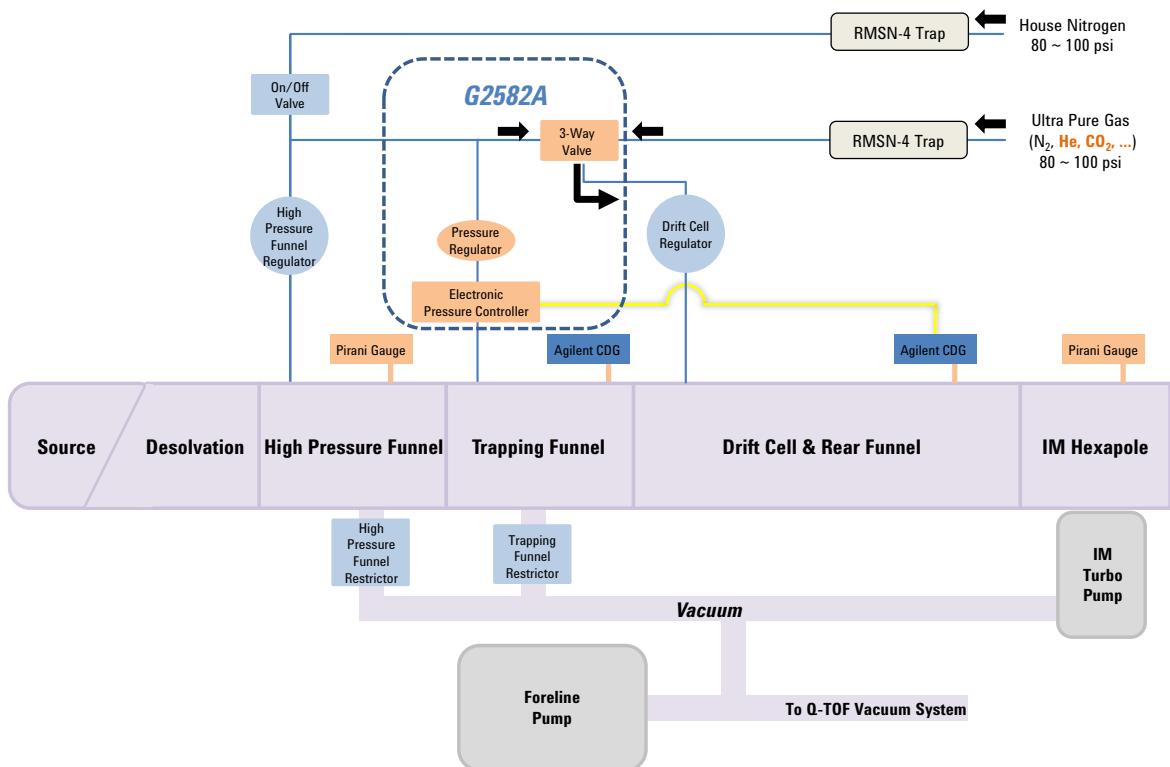

Figure 2   Gas plumbing for IM-QTOF instrument (IM section) with the Drift Gas Upgrade Kit installed

Alternative drift gases are supported because the Capacitance Diaphragm Gauges can read true pressure accurately regardless of the drift gas that is used. Static drift tube pressure is maintained regardless of changing system conditions because the drift tube pressure is electronically controlled in real time.

Source Configuration

This guide shows you how to configure the IM-QTOF instrument with installed Drift Gas Upgrade Kit for the selected spray chamber and drift gas.

WARNING **Do not use corrosive or flammable drift gases. Use of such gases can result in an explosion.**

HPLC-Chip Cube/Nanospray Sources

To use G4240A HPLC-Chip Cube and G1992A Nanospray ESI sources with the IM-QTOF instrument, configure the plumbing as shown in Figure 3.

The HPLC-Chip Cube and Nanospray ESI sources require air to be included in the drying gas to prevent charging in the ion source. However, air is not a supported drift gas, and must be excluded from the IM-QTOF drift gas plumbing.

Therefore, any air that is plumbed to the nitrogen drying gas line for the Q-TOF section must be kept separate from the House Nitrogen drift gas line for the IM Section.
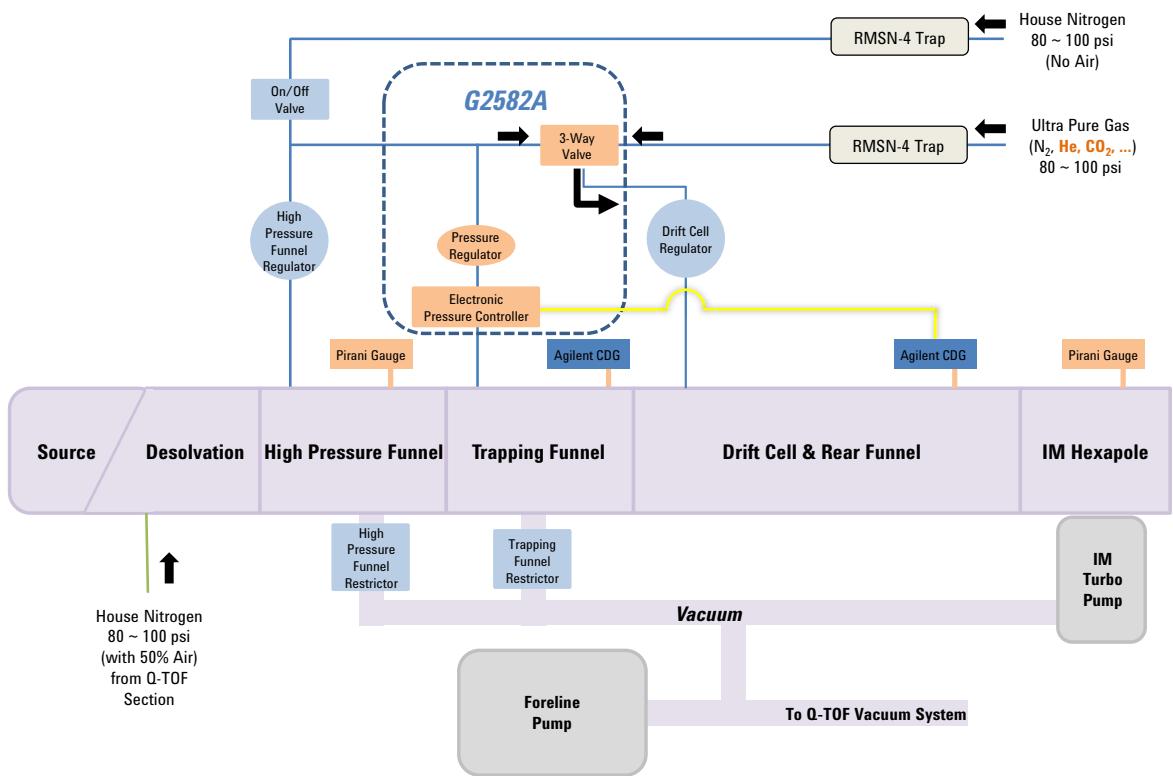
Figure 3 Gas plumbing for the IM section of the IM-QTOF instrument to use the HPLC-Chip Cube or Nano-spray ESI source

Other Sources

For sources other than the HPLC-Chip Cube or Nanospray ESI, air must be excluded in the drying gas. The same House Nitrogen line can be used for both the Q-TOF drying gas supply and the IM section of the IM-QTOF instrument.

The House Nitrogen supply must meet minimum flow, pressure and purity requirements for each function.

System Configuration for Different Drift Gases

This section describes the different ways to configure the IM-QTOF system for different drift gas sources.

The expected gas consumption by the IM section of the IM-QTOF instrument is approximately 1 liter/minute. The Q-TOF section nitrogen gas consumption varies based on method parameters. The maximum consumption rate is 30 liters/minute.

To configure the IM-QTOF system for House Nitrogen drift gas

1 Turn the 3-way valve to the **House Nitrogen** position. See Figure 4.

2 Adjust the High Pressure Funnel pressure regulator and Drift Cell pressure regulator. See "To adjust the High Pressure Funnel pressure regulator and Drift Cell pressure regulator" on page 10.

This gas plumbing configuration introduces House Nitrogen into the High Pressure Funnel, Trapping Funnel and the Drift Cell.
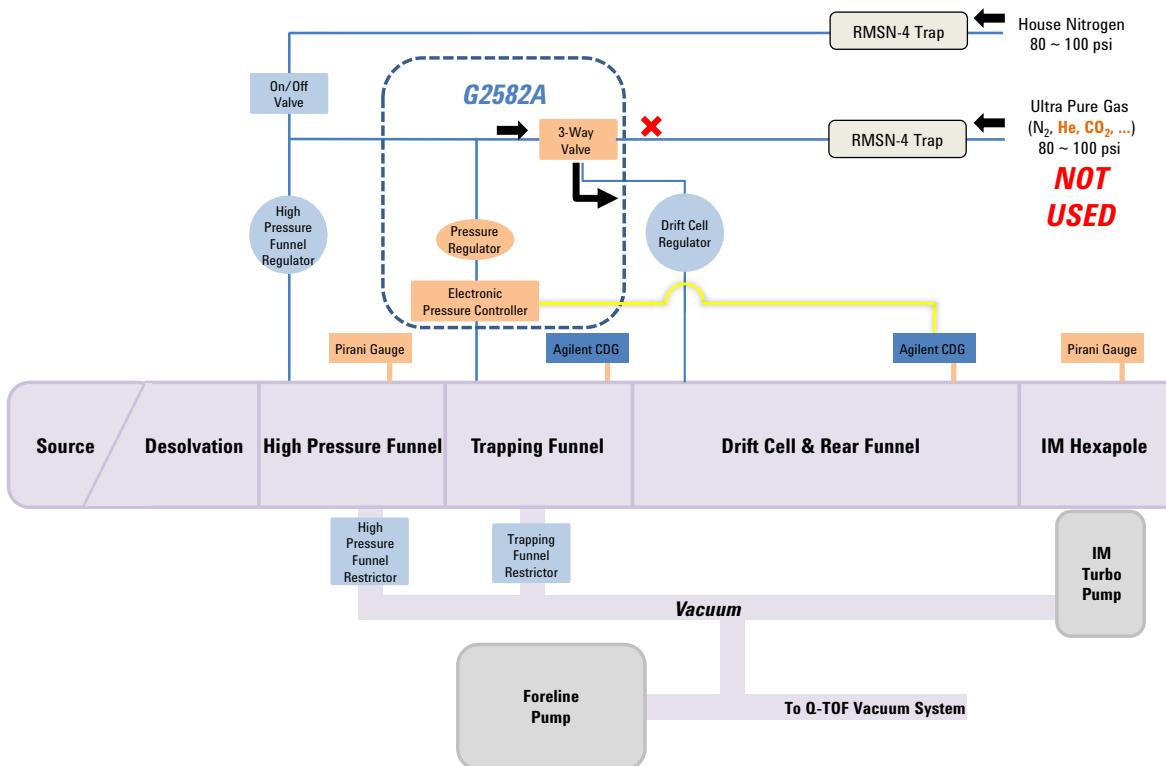

Figure 4   Gas plumbing for the IM section of the IM-QTOF instrument for use with House Nitrogen drift gas

To configure the IM-QTOF system for High Purity drift gas

1 Connect the High Purity Drift Gas to the inlet of the appropriate RMSN-4 gas filter.

2 Turn the 3-way valve to the **High Purity Drift Gas** position. See Figure 5.

3 Adjust the High Pressure Funnel pressure regulator and Drift Cell pressure regulator. See "To adjust the High Pressure Funnel pressure regulator and Drift Cell pressure regulator" on page 10.

This gas plumbing configuration introduces House Nitrogen into the High Pressure Funnel and Trapping Funnel while High Purity drift gas is introduced into the Drift Cell.
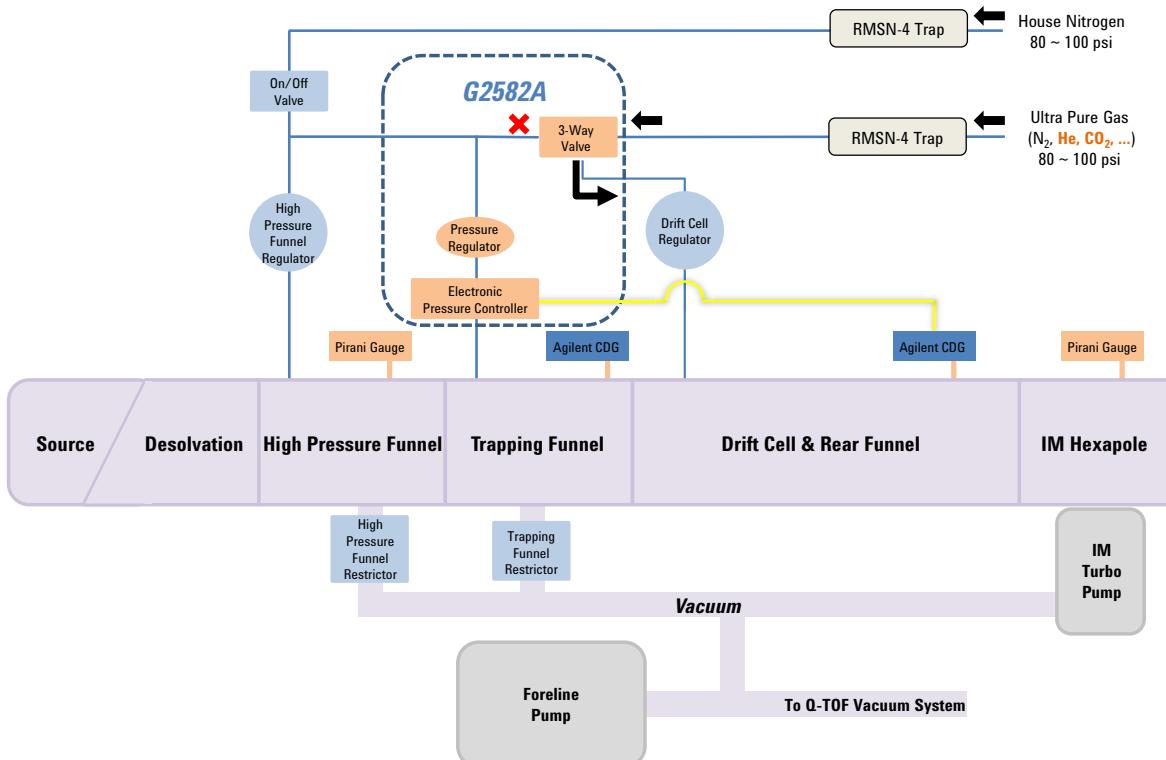
Figure 5   Gas plumbing for the IM section of the IM-QTOF instrument to use High Purity drift gas

To configure the IM-QTOF system for alternative drift gases

1 Connect the High Purity Drift Gas to the inlets of both RMSN-4 gas filters (**House Nitrogen** and **High Purity Drift Gas Line**).

2 Turn the 3-way valve to the **High Purity Drift Gas** position. See Figure 6.

3 Adjust the High Pressure Funnel pressure regulator and Drift Cell pressure regulator. See "To adjust the High Pressure Funnel pressure regulator and Drift Cell pressure regulator" on page 10.

This gas plumbing configuration introduces High Purity drift gas into the High Pressure Funnel, Trapping Funnel and the Drift Cell to allow the highest partial pressure of the desired drift gas in the Drift Cell.
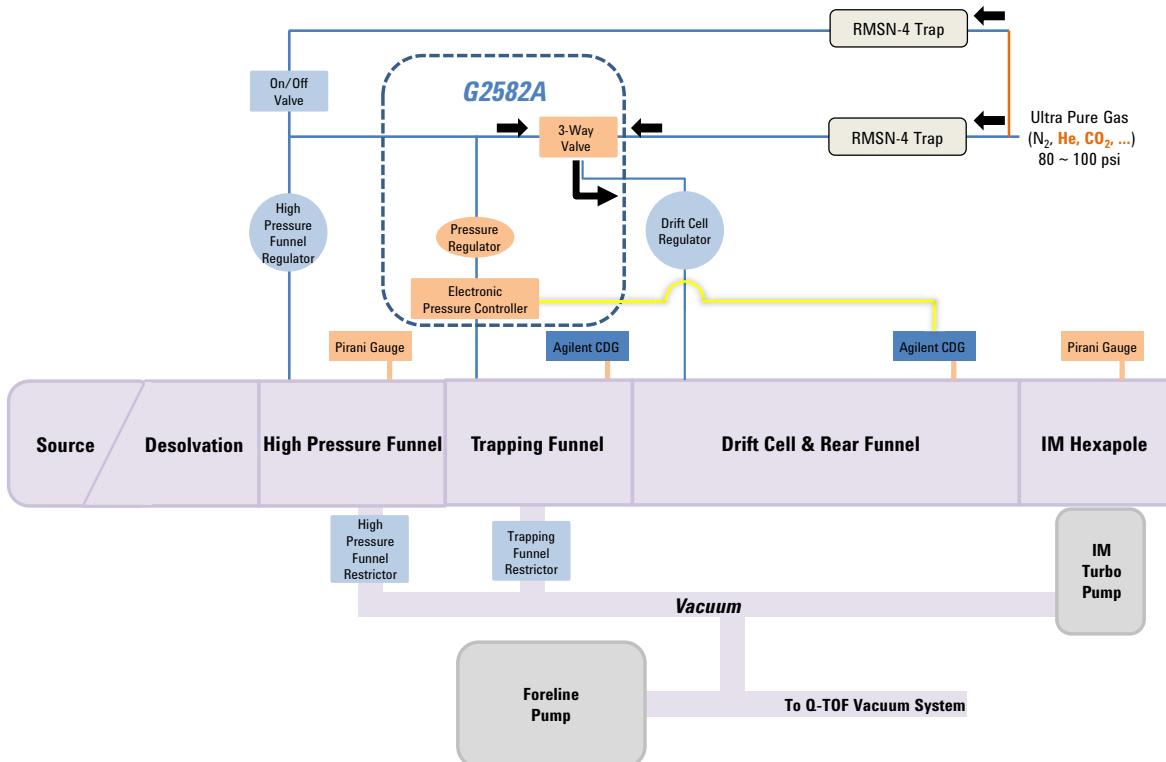
Figure 6   Gas plumbing for the IM section of the IM-QTOF instrument to use an alternative Drift Gas

To adjust the High Pressure Funnel pressure regulator and Drift Cell pressure regulator

1 Make sure that the IM-QTOF system is equilibrated in **QTOF-Only Acquisition Mode** with the operating source conditions as shown in Figure 7.
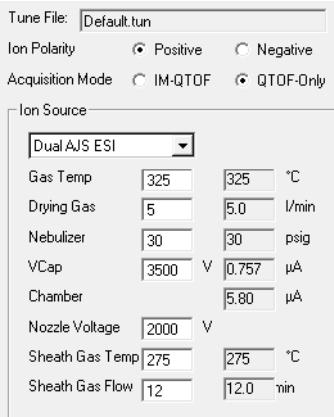
Figure 7   Operating conditions

2 Use a terminal emulator program to connect to the IM section of the IM-QTOF.

3 Adjust the High Pressure Funnel pressure regulator:

    a In the terminal emulator, press **Esc**.

    b Enter 5 to open the Control menu.

    c Type SPR 2.00 and press **Enter** to set the drift cell pressure to 2.00 Torr. This value effectively turns off the pressure controller.

    d Type ISA press **Enter** to monitor the High Pressure Funnel pressure.

    e Turn the **HP Funnel** knob to adjust the High Pressure Funnel pressure to approximately **4.80 Torr**. Monitor the **Gauge 0** status. See Figure 8 and Figure 9.

Figure 8   Adjusting the High Pressure Funnel pressure regulator

Figure 9   Monitoring High Pressure Funnel Vacuum (Gauge 0)

4 Adjust the Drift Cell pressure:

   a In the terminal emulator, type SPR 3.950 and press **Enter**.

   b Turn the **Drift Cell** knob to adjust the Trapping Funnel (Gauge 1, labeled as **1p**) pressure to **3.80 Torr**. See Figure 10.

   c Type ISA and press **Enter** to monitor the pressure readings.

Figure 10   Adjusting the Drift Cell pressure regulator

www.agilent.com

In This Book

This guide contains information to run the Drift Gas Upgrade Kit.

G1996-90001

Agilent Technologies